Colloquium

Department of Physics, Temple University

Large-scale Galactic Ouflows and Tidal Processes of the Magellanic Cloud Galaxies

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Abstract

The environment that galaxies live in strongly influences their shape, overall structure, and how they grow. The ability of galaxies to obtain and retain gas strongly impacts their ability to form future stars, but the cycle of gas flowing into and out of galaxies is poorly resolved due to the diffuse and ionized nature of these gas clouds. The gas flows associated with the two nearby Magellanic Cloud galaxies provided us with an advantageous opportunity to study this cycle in detail. Through velocity resolved ultraviolet and opitcal observations of the elusive ionized gas in their surroundings—using the Hubble Space Telescope and the Wisconsin H-alpha Mapper (WHAM) telescope—we determined the origins, properties, and fates of these gas flows. We found that the active stellar activity, induced by galaxy interactions between the binary Magellanic Cloud galaxies, is driving an intense and pervasive galactic wind and is ejecting over ten million times the mass of our Sun of material out of these galaxies. Additionally, the tidal interactions between these two galaxies have torn billions of solar masses of gas from them. Combined, galactic winds and tidal processes have displaced 2/3 of the gas from these galaxies into their surroundings. This dislodged gas acts as a massive external reservoir that feeds the Milky Way and could solve the long standing mystery of how our Milky Way galaxy will feed itself for many billions of years to come and is providing insights on how these processes likely occur in distant galaxies where these processes cannot be fully resolved.

Monday, February 11, 2019 at 3:00 pm,
SERC, Room 116
Refreshment will be served at 2:45 pm